Casemix Service
HRG4

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HRG4 Companion

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The Casemix Service designs and refines classifications that are used by the NHS in England to describe healthcare activity

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Glossary of Terms
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1 Introduction to HRG4 4
1.1 HRG4 4
1.2 Healthcare Resource Groups 4
1.3 HRG4 Groupers 4
2 HRG4 Design Concepts 5
2.1 The Casemix Design Framework 5
2.2 HRG4 Code Structure 5
2.3 Setting Independence 6
2.4 HRGs for Non-Admitted Care 6
3 HRG4 Grouping Logic 7
3.1 Procedure Hierarchies 7
3.2 Diagnosis Hierarchies 8
3.3 Complication and Comorbidity Splits 8
3.4 Multi-episode Spells 9
3.5 Multiple trauma 9
3.6 Accommodating Multiple Procedures 9
3.7 Unbundling 10
4 Stakeholder Engagement 12
5 Further Information 13
Useful Links and Contact Details 13
HRG4 Casemix Design Framework 13
Clinical Bodies Represented on EWGs 14
The HRG4 Documentation Suite 15

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1 Introduction to HRG4

1.1 HRG4

HRG4 is a casemix classification which aggregates patient level data into Healthcare Resource Groups (HRGs). Casemix is a system whereby the complexity of care provided to a patient is reflected in an aggregate secondary healthcare classification. HRG4 was developed to support the Department of Health Payment by Results (PbR) national policy by providing a classification framework that represents current clinical practice. In addition, HRG4 supports service planning, costing and commissioning between PCTs and trusts by providing reliable and consistent activity data to:

- Support the focus on patient-centred care to enable patient choice
- Support the analysis of healthcare needs and monitoring of service provision to inform service planning

HRG4 was developed as the successor to HRG v3.5. In addition to the introduction of several new design concepts, the main benefits of HRG4 are increased scope, settings, granularity and specificity. These benefits are optimised through accurate, good quality coding.

1.2 Healthcare Resource Groups

Healthcare Resource Groups (HRGs) are clinically meaningful groupings of patient activity, based on both procedures and diagnoses. These groups are similar from a resource perspective to ensure that they also support national funding policy. HRGs are the main grouping methodology that the Casemix Service develops and supports.

HRGs offer organisations the ability to understand their activity in terms of the types of patients they care for, and the treatments they undertake. They enable the comparison of activity within and between different organisations and provide an opportunity to benchmark treatments and services to support trend analysis over time.

HRGs are currently used as a means of determining fair and equitable reimbursement for care services delivered by providers. These consistent 'units of currency' support standardised healthcare commissioning across the service.

1.3 HRG4 Groupers

The HRG4 grouper is a software application that implements the HRG4 design in order to process patient records. The grouper software application performs validation checks on the required fields and then uses a complex mapping algorithm to assign HRGs to the patient records.

The grouper produces output data files which contain the original input data with assigned HRGs and quality files containing details of any errors or conflicts.

Full instructions on how to prepare data for use with the HRG4 grouper and use the Grouper, can be found in the HRG4 Guide to File Preparation and HRG4 Grouper User Manual.

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2 HRG4 Design Concepts

2.1 The Casemix Design Framework

HRG4 design is governed by the Casemix Design Framework which provides comprehensive guidance for the various stakeholders involved in the design process with regard to HRG scope and concepts, format, data and performance requirements.

These stakeholders are predominantly comprised of representatives from the relevant Royal Colleges and clinical professions, colleagues from the Department of Health Policy and Operations team and other interested bodies such as NHS Connecting for Health, the independent sector and NHS Chief Executives. In summary the design rules stipulate:

- The data used to define the HRGs should ideally be routinely available
- There should be a manageable number of HRG groupings to cover all patients
- Each HRG should contain activity with a similar pattern of resource intensity and be clinically meaningful
- The HRG should be designed to encourage patient choice and the provision of care in different settings

2.2 HRG4 Code Structure

HRG4 uses a 5 character code structure to identify HRGs; AANNA.

Chapter /Subchapter	HRG Number	Split
AA	NN	A

- The first character represents the **HRG Chapter**
- The first two characters **together** represent the **HRG Subchapter**.
- The next two numeric characters represent the **HRG Number** within the chapter.
- The final character signifies the **Split** applicable to the episode.

Chapters/Subchapter

Healthcare Resource Groups are divided into clinically meaningful sections known as **chapters** and **subchapters**.

Subchapters are identified by a two character code. The first character indicates the chapter and the second character indicates the subchapter.

HRG Number

A two digit numeric code which identifies the HRG within the chapter. In principle, the lower the HRG number within a chapter, the higher the expected resource use of that HRG, relative to other HRGs within that chapter.

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Split

A **split** is a single character code which details the presence of splits which further describe the activity, such as age, length of stay or complications. A value of 'Z' indicates no split.

The example below shows the code structure for an HRG with split. In this case the split value of 'A' represents an age split. The details of the split are defined in the HRG label.

Chapter /Subchapter	HRG Number	**Split**	HRG Label
LA	03	**A**	Kidney Transplant **19 years and over** from Live donor

The information represented by the split value can vary across subchapters. A value of 'A' represents an age split in Subchapter LA, but that does not mean that 'A' necessarily represents age split across all subchapters.

2.3 Setting Independence

HRG4 supports setting independent service delivery. This means that if a procedure or intervention can be performed across different care settings then the same HRG can be derived regardless of setting. For example, an endoscopy would generate the same HRG regardless of whether it was performed as an outpatient, a daycase or an inpatient procedure.

This rule applies to procedure (OPCS) based HRGs only and does not apply to diagnosis (ICD-10) based HRGs.

2.4 HRGs for Non-Admitted Care

Outpatient HRGs require that a procedure is recorded where relevant but do not use diagnosis data even if recorded. Outpatient HRG derivation cannot be dependent on diagnosis as the data is not mandated as part of the outpatient Commissioning Data Set (CDS).

The underlying procedure required for HRG derivation may not always be recorded for outpatients or ward attenders, and it is also possible that a procedure is not carried out. In these situations HRG4 allows allocation of an HRG where minimum mandatory information is recorded. These are assigned to one of the global Non-Admitted HRGs within Subchapter WF:

For further information, please refer to the HRG4 Chapter Summary for WF, Non-Admitted Consultations.

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3 HRG4 Grouping Logic

3.1 Procedure Hierarchies

Using clinical knowledge and cost data each procedure code has been assigned a hierarchy level associated with its resource consequences. These hierarchies provide a comparator mechanism that ranks all procedures and considers their relative complexities across all HRG chapters.

- If only one procedure is recorded within a patient record and it has a hierarchy value of 3 or more then this procedure will be used for grouping. If more than one procedure is recorded then all procedures within the record will be examined.
- If more than one procedure has been recorded, the grouper will select the dominant procedure by referencing the hierarchical ranking of each procedure. The dominant procedure will be used to drive the grouping process.
- In the case of there being two or more procedures of equal hierarchical ranking within the record, the first will be used to determine the HRG
- In the absence of any procedure, or where a procedure is deemed insignificant for grouping, primary diagnosis will drive the HRG.

In Payment Grouper products for the 2011/12 financial year there are eleven bands, running from 3 to 13 inclusive, with band 3 representing the lowest expected resource use and band 13 representing the most resource intensive procedures.

From the 2012/13 financial year for Payment and the HRG4 2009/10 Reference Costs Grouper the number of bands has been extended to thirteen, running from 3 to 15 inclusive. This is to accommodate coding of outpatient consultations. Bands 3 and 4 represent uniprofessional and multiprofessional consultations only. Band 5 becomes the lowest significant band for procedures excluding outpatient attendances with band 15 representing the most resource intensive procedures.

- **Band 0** represents procedures which alone are not valid in the primary position and are therefore invalid for grouping, such as approach or site of operation codes.
- **Band 1** represents procedures whose resource use is minimal and where diagnosis is used as the driver in grouping. These are generally non-operative procedures such as fitting a sling or administering an injection.
- **Band 2** represents procedures that will generate unbundled HRGs. Procedure hierarchies are not used to determine unbundled HRGs as every instance of such a procedure being recorded will generate an unbundled HRG. A hierarchy value is assigned for methodological completeness.
- **Band 3** represents procedures only coded for outpatients that represent only uniprofessional-disciplinary attendance.
- **Band 4** represents procedures only coded for outpatients that represent only multiprofessional-disciplinary attendances.

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3.2 Diagnosis Hierarchies

Using clinical knowledge and length of stay analysis each diagnosis code has been assigned a hierarchy level associated with its resource consequences. Like the procedure hierarchies, this provides a comparator mechanism to rank diagnoses according to their relative complexities across all HRG chapters.

- For single episode spells, the primary diagnosis will be that recorded in the appropriate primary diagnosis field of the patient record.
- For multiple episode spells where a procedure deemed significant for grouping has occurred, the primary diagnosis for the spell will be that of the episode containing the most significant procedure, as determined by the procedure hierarchy.
- For multiple episode spells where no procedure significant for grouping is recorded, or where procedures have been unbundled, and where primary diagnoses differ between episodes in the spell, the spell primary diagnosis will be determined by referencing the hierarchical ranking of each of the primary diagnoses. The primary diagnosis with the highest hierarchy value will be used to drive the grouping process for the spell.
- In the case of there being two or more diagnoses of equal hierarchical ranking within the record, the first will be used to determine the HRG

There are five diagnosis hierarchy bands, running from 3 to 7 inclusive. Band 3 represents the lowest expected resource use and band 7 represents the most resource intensive diagnoses.

3.3 Complication and Comorbidity Splits

Complication and comorbidity splits are a way of incorporating varying severity and complexity levels within the design of the HRGs.

Where clinically relevant to do so, an HRG is split by complication and comorbidity (CC) by use of a subchapter-specific CC list, whose purpose is to reflect diagnoses that are expected to result in additional resources being used and ‘split’ HRGs accordingly.

A particular diagnosis may be a major complication for some procedures whilst not being a relevant complication for others. The relevance and ranking of complications and comorbidities are regularly assessed at subchapter level by individual Expert Working Groups to ensure they remain appropriately allocated and ranked.

CC splits and Non-Admitted Consultation treatments

Diagnosis is not a mandatory item in the Outpatient Commissioning Data Set. The grouping process does not, therefore, use diagnosis for Non-Admitted Consultation treatments and so cannot apply complication and comorbidity splits.

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3.4 Multi-episode Spells

In a multi-episode spell, all diagnoses are evaluated as potential complications and comorbidities, with the exception of the primary diagnosis for the episode containing the dominant procedure.

All diagnoses within a spell other than the spell primary diagnosis is regarded as a secondary diagnosis for the purposes of CC checking, with the exception of duplicate diagnoses within a spell and four-digit ICD-10 codes that end in .9 where the same three-digit ICD-10 code has been determined as the primary diagnosis of the spell.

3.5 Multiple trauma

A mechanism has been developed to identify high resource, complex diagnoses and treatments associated with multiple trauma cases. For example, significant simultaneous traumatic injuries involving more than one body area. Traumatic single injuries are addressed elsewhere within the relevant chapters. For further information, please refer to the HRG4 Chapter Summary for VA, Multiple Trauma.

3.6 Accommodating Multiple Procedures

In the majority of cases the dominant procedure (as determined by the procedure hierarchy) is used to derive the HRG. However certain subchapters contain specific multiple procedure logic, designed to determine the derived HRG using more than one procedure.

Multiple Procedure Logic

Where there are a relatively small number of procedures that can be performed in combination with one another, flags may be used to derive the HRG, dependant on what other procedures are recorded along with the dominant procedure.

For example, if **P231, Anterior and posterior colporrhaphy NEC** is recorded as the dominant procedure with no other procedures present, then HRG **MA03B, Lower Genital Tract Major Procedures without CC** will be assigned.

If **Q088, Other specified vaginal excision of uterus** is recorded as the dominant procedure with no other procedures present, then HRG **MA07B, Upper Genital Tract Major Procedures without malignancy without CC** will be assigned.

However if either if these procedures are the dominant procedure and the other procedure is also recorded within the record then the HRG derived will be **MA02Z, Lower and Upper Genital Tract Complex Major Procedures**.

Both procedures have an associated flag attached which requires the grouper to reference a list containing the other procedure. Where both procedures are identified within the record an HRG is assigned which considers both significant procedures.

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Escalator Logic

Escalator logic can drive grouping to a higher HRG to reflect additional complexity. If a procedure is performed in conjunction with another procedure from a specified list, an HRG will be derived representing higher resource use than would have been the case for either procedure on its own.

For example, if **W471, Primary prosthetic replacement of head of femur not using cement** is recorded as the dominant procedure with no other procedures present, then HRG **HA13C Intermediate Hip Procedures for Trauma without CC** will be assigned.

However if a procedure from any other HA or HB 'Intermediate' Category HRG is also recorded such as **W042, Triple fusion of joints of hindfoot** (which as a dominant procedure would map to **HB32Z Intermediate Foot Procedures for non -Trauma Category 2**) then this is escalated to the 'Major' category HRG, in this case **HA12C, Major Hip Procedures Category 1 for Trauma without CC**.

Summation Logic

In Subchapter BZ, secondary procedures have a modifying effect on HRG assignment. All Vitreous Retina (VR) procedures have been assigned to a VR band from 1 to 5 depending on their relative complexity. The higher the VR band the higher the complexity.

The Vitreous Retina HRGs are assigned based on the sum of the bands of all VR procedures present within a record.

Sum of VR Bands	HRG
0, 1 or 2	BZ23Z Vitreous Retinal Procedures - category 1
3, 4 or 5	BZ22Z Vitreous Retinal Procedures - category 2
6, 7, 8, 9 or 10	BZ21Z Vitreous Retinal Procedures - category 3
11 or over	BZ20Z Vitreous Retinal Procedures - category 4

For example, **C791, Vitrectomy using anterior approach** + **C831 Pigment epithelium translocation of retina**. These procedures have VR bands of 3 and 4 making a total of 7, so the HRG derived would be **BZ21Z, Vitreous Retinal Procedures - category 3**.

Please note that the multiple procedure logic examples provided in section 3.7 are valid for the HRG4 2011/12 Local Payment Grouper design and may not apply within the HRG4 2010/11 Reference Costs Grouper design.

For further details and worked examples of specific multiple procedure logic, please refer to the HRG4 Chapter Summaries.

3.7 Unbundling

Unbundling is the first step in the grouping process, following data validation. Unbundled procedures are processed separately to derive unbundled HRGs. The grouper then ignores these unbundled components when deriving the core HRG for an episode or spell.

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When all significant procedures in an admitted patient care episode or spell are unbundled, diagnosis is used to derive a core HRG for the episode. For non-admitted care, if all procedures are unbundled the episode is allocated one of the eight relevant non-admitted care attendance HRGs as a core HRG.

Unbundled HRGs have been developed for following service areas:

- Chemotherapy – procurement and delivery
- Radiotherapy – planning and delivery
- Diagnostic Imaging
- Rehabilitation
- Critical Care
- Specialist Palliative Care
- High Cost Drugs

Unbundled HRGs provide the following benefits:

- Better representation of activity and cost
- Support for service redesign
- Support for Patient Choice.

Some significant elements of cost and activity can be 'unbundled' from core HRGs. The impact of unbundling is that a case will be assigned more than one HRG if it includes any unbundled elements. The 'Unbundled components' become an HRG in their own right as additions to a core HRG. For example, a case could be assigned the following HRGs depending on the elements of care recorded within it:

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4 Stakeholder Engagement

It is widely recognised that one of the major strengths of HRG4 is the level of clinical involvement in its development, and the importance of Casemix Stakeholder Engagement groups has been acknowledged by the Department of Health, the NHS, Royal Colleges and numerous professional and other bodies.

The HRG4 Development Programme remains committed to an iterative process of stakeholder consultation. Each subchapter has at least one Expert Working Group (EWG) assisting and advising on the definitions of the HRGs within it. Expert Reference Panels and Steering Groups provide cross-chapter interface in areas such as Rehabilitation and High Cost Drugs.

These groups provide invaluable medical, financial and allied health professional guidance for the design and development of HRGs. They are made up of

- Clinical Specialists from 78 NHS Trusts
- 38 NHS Finance Representatives
- 29 Specialised Services Representatives
- Clinical Representatives from 51 Royal Colleges and Professional Bodies

HRGs could not have been developed without the commitment of members of these stakeholder groups. HRG4 is updated on an annual basis to ensure clinical relevance and design accuracy. The key role played by EWGs and other advisory bodies continues through ongoing maintenance and enhancement by reviewing and where necessary revising design parameters and assessing the performance of HRGs.

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5 Further Information

Useful Links and Contact Details

NHS Information Centre	**www.ic.nhs.uk**
Casemix and Healthcare Resource Groups:	www.ic.nhs.uk/casemix
Telephone:	0845 300 6016
Email:	enquiries@ic.nhs.uk
NHS Connecting for Health	**www.cfh.nhs.uk**
OPCS:	www.cfh.nhs.uk/opcs
World Health Organisation	**www.who.int**
ICD-10	www.who.int/classifications/icd
Department of Health (Payment by Results)	**www.dh.gov.uk/pbr**

Reference Costs Collection Guidance (2009/10 financial year)
www.dh.gov.uk/en/publicationsandstatistics/publications/DH_112590

Reference Costs Publications (2008/09 financial year)
www.dh.gov.uk/en/publicationsandstatistics/publications/DH_111591

National Tariff and Supporting Information (2010/11 financial year)
www.dh.gov.uk/en/publicationsandstatistics/publications/DH_112284

HRG4 Casemix Design Framework

The Casemix Design Framework is maintained by the Design Authority for Casemix, who provide a strategic steer for all stakeholder groups with regard to maintaining consistency of design intent and methodology across current HRG chapters.

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Clinical Bodies Represented on EWGs

The following organisations were formally represented on the Expert Working Groups involved in development:

- Association of British Neurologists
- Society of British Neurological Surgeons
- Royal College of Anaesthetists
- British Pain Society
- Royal College of Ophthalmologists
- British Association of Otorhinolaryngologists, Head and Neck Surgeons
- Faculty of Dental Surgery
- British Thoracic Society
- Society of Cardiothoracic Surgeons
- British Cardiac Society
- Royal College of Surgeons
- British Society of Gastroenterology
- British Association of Rheumatology
- British Geriatrics Society
- British Orthopaedic Association
- British Association of Surgical Oncologists
- British Burns Association
- British Association of Plastic Surgeons
- British Association of Dermatologists
- Association of Genito-urinary Medicine
- British Diabetic Association
- British Association of Urological Surgeons
- Renal Association
- Royal College of Obstetricians and Gynaecologists
- Royal College of Paediatrics and Child Health
- British Association of Perinatal Medicine
- Vascular Society
- Royal College of Radiologists
- British Nuclear Medicine Society
- British Society of Haematologists
- Faculty of Clinical Oncology
- Joint Collegiate Committee of Oncology

We gratefully acknowledge the support given to us by these organisations. Their input was central to the design and development of HRG4 and has helped us to ensure that it is clinically meaningful and that it accurately reflects current working practice.

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The HRG4 Documentation Suite

The HRG4 Documentation Suite is a comprehensive resource of supporting materials, designed to assist users in understanding the design concepts, logic and practical use of the HRG4 Grouper. Below is a list of the various HRG4 documents which are available to download from The Casemix Service website www.ic.nhs.uk/casemix

HRG4 Companion is a starting point and general reference for new and existing users, providing an introduction to HRGs, groupers, HRG4 design concepts and grouping logic and useful links to further information.

Casemix Design Framework defines the rules and criteria followed when designing Casemix classification systems.

HRG4 Guide to File Preparation assists users in preparing data for use with the grouper application.

HRG4 Grouper User Manual provides full instructions on how to group data with the HRG4 Grouper software application.

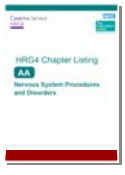
HRG4 Summary of Changes document provides an overview of the main changes between the current HRG4 grouper design and its predecessor.

HRG4 Roots workbook identifies new HRGs, deleted HRGs and changes to existing HRG Labels between designs using colour-coding.

HRG4 Chapter Summaries provide an overview of the scope, composition and grouping logic of individual subchapters along with illustrative worked examples. They also include updates on the changes within subchapters.

HRG4 Code to Group workbook provides details on all mappings between primary classification codes and HRGs. Also detailed within the workbook are the logic conditions required to generate the HRGs.

HRG4 Code to Group User Manual serves as an introduction to using the Code to Group workbook to perform manual grouping. It also details some basic design concepts and provides worked examples of a variety of different grouping scenarios.



HRG4 Chapter Listings provide details, listed by HRG, of the codes that can map to those groups, along with details of flags, lists and complications and comorbidities

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